

Review

Drug facilitated sexual assault – A review

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Abstract

This review was undertaken to identify the evolutionary process in the current understanding of allegations of drug facilitated sexual assault (DFSA), so that those who work in this field may gain a better understanding of the complexities involved in such cases. Several definitions of DFSA are provided as well as a list of intoxicating substances which have so far been incriminated in this crime. Perception and alcohol use is addressed, whilst an examination of intoxication and victim outcomes reveals disturbing but important information which needs to be centrally placed within health education campaigns with a degree of urgency. The review identifies the effects of alcohol on sexual behaviour, drinking patterns and specific quantitative research indicating very high alcohol levels in some instances. In practical terms, suggestions are made following Operation Matisse, to address prevention, early detection and easier identification of DFSA cases so that victims' needs are prioritised and appropriately addressed.

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1. Introduction**1.1. Definitions**

Drug Facilitated Sexual Assault (DFSA) has been defined as offences in which victims are subjected to non-consensual sexual acts, while they are incapacitated or unconscious due to the effects of alcohol and/ or drugs and are therefore prevented from resisting or are unable to consent^{1,2}. Lebeau and Moyazani³ identified 3 different sets of circumstances relevant to the understanding of allegations of sexual assaults of this nature. These were: Involuntary ingestion of incapacitating substances by the victim; voluntary and involuntary ingestion of incapacitating substances by the victim; and voluntary ingestion of incapacitating substances by the victim.³

Stated simply, DFSA is sexual activity occurring where consent is invalid or absent due to the effects of drugs, including alcohol.⁴ To date, toxicologists have preferred the definition of a drug, noxious substance or chemical agent to facilitate sexual contact.⁵ However, following the most recent investigation of DFSA in England by the combined efforts of ACPO (Association of Chief Police Officers), FSS (Forensic Science Service) and SARCs (Sexual Assault Referral Centres) it has now been suggested that DFSA should be redefined as, Proactive DFSA: The covert or forcible administration to a victim of an incapacitating or disinhibiting substance by an assailant for the purpose of sexual assault, or, Opportunistic DFSA: sexual activity by an assailant with a victim who is profoundly intoxicated by his or her own actions to the point of near or actual unconsciousness.⁶

On the other hand, since the 1980s the term 'date-rape' has been commonly used as *awareness of the phenomenon increased exponentially*.⁷ From this time, definitions such as "rape perpetrated by the victim's social escort", or,

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“rape in which the rapist is known to the victim (as when they are on a date together)”⁷ have existed, in association with a perception that drink-spiking has played a pivotal role in the commission of this offence.

1.2. Intoxicating substances

Many authors have indicated that DFSA is not a new phenomenon but rather an age-old practice, which has included the use of alcohol, chloral hydrate, barbiturates, scopolamine, knock out drops or a Mickey Finn.^{4,8} Ideally, for the purposes of date-rape, an intoxicating substance should be colourless, odourless and tasteless. It should also act rapidly, produce disinhibition, relaxation of voluntary muscles and cause the victim to have lasting anterograde amnesia for events that occur under the influence of the drug.⁹

In 1999, Elsohly and Salamone¹⁰ identified approximately 20 different substances associated with this crime, the most common being ethanol, followed by cannabinoids, cocaine, benzodiazepines, amphetamines and GHB (gammahydroxybutyrate).¹⁰ In the same year, Slaughter¹¹ had analysed 2003 urine specimens in an effort to identify specific date-rape drugs. Almost two-thirds of the samples contained alcohol and/or drugs. Alcohol was found in 63% and marijuana in 30%, whilst GHB and flunitrazepam were found in <3% of the positive samples.¹¹ In 2001, Hindmarch et al.⁸ analysed 3303 urine samples from individuals who claimed to have been sexually assaulted and believed that drugs were involved. Their results indicated that alcohol, either alone or in combination with other drugs, was by far the commonest substance found, being present in 67% of cases. Cannabis was the second most prevalent drug, present in 30.3% of cases. Positive results were also obtained for cannabis alone (9.6%), benzodiazepines (4.8%), cocaine (2.8%), amphetamines (1.9%), opiates (0.69%), barbiturates (0.54%) and propoxyphene (0.30%). They concluded that detailed examination of the testing results does not support the contention that any single drug, apart from alcohol, can be identified as a date-rape

drug. Rather, the alleged sexual assaults may often take place against a background of licit or recreational alcohol or drug use, where alcohol and other drugs are frequently taken together.⁸

In 2005, Scott-Ham and Burton⁵ published detailed work highlighting findings from an analysis of 1014 cases of claimed drug facilitated sexual assault (DFSA). They found that alcohol (either alone or with an illicit and/or medicinal drug) was detected in 46% of cases. Cannabis was found in 26% of cases, cocaine in 11% of cases. Smaller amounts of other illicit substances such as ecstasy, amphetamines, heroin and ketamine were also detected. Both sedative and non-sedative therapeutic drugs were identified, 16% and 21%, respectively. – see Table 1. One case identified the anti-obesity drug phentermine and one case contained lignocaine, a local anaesthetic. The authors concluded that approximately 2% of cases could have been identified as deliberate spiking cases, but warned that this figure may not necessarily reflect the true number of DFSA cases that had occurred. Two reasons for obtaining false negative results (i.e. no drug detected) were suggested; a delay in obtaining samples and an absence of urine samples taken. Early recovery of samples is particularly relevant for drugs that are eliminated quickly such as GHB (gammahydroxybutyrate) and its related compounds.⁵

Australian researchers, Hurley, Parker and Wells published their findings in 2006, showing that 77% of alleged DFSA cases had consumed alcohol in the hours prior to the assault, whilst 49% reported using prescription medications and 26% reported the use of recreational drugs. They also discovered that in 20% of cases, drugs were detected which had not been reported. These included cannabis, antidepressants, amphetamines, benzodiazepines and opiates.⁴

In March 2006, a French literature review, set out to describe the present knowledge about chemical submission. It concluded that ethanol and benzodiazepines were the most frequently used substances whilst a few drugs, including flunitrazepam and GHB have received widespread media coverage.¹²

Table 1
Non-sedative therapeutic drugs identified by Scott-Ham and Burton⁵

Group	Name	Name	Name
Simple analgesics	• Paracetamol	• Ibuprofen	• Aspirin
Antidepressants	• Fluoxetine	• Venlafaxine	• Sertraline
Cough + cold remedies	• Citalopram	• Paroxetine	• Dothiepin
Anti-migraine/anti-emetics	• Pholcodeine	• Pseudoephedrine	• Methylephedrine
	• Metoclopramide	• Tramadol	• Sumatriptan
Anti-virals, bacterials, malarials	• Diclofenac	• Cyclizine	• Mefloquine
	• Chloroquine	• Metronidazole	
	• Triclosan	• Trimethoprim	
Anti-epileptics	• Phenytoin	• Lamotrigine	• Valproate
	• Carbamazepine		
Cardiovascular/anti-tremor	• Atenolol	• Tetrabenazine	• Propanolol
	• Verapamil		
Anti-psychotics	• Olanzapine	• Chlorpromazine	

1.3. Perceptions and alcohol

According to Plant, archaeological evidence shows that people have been making and consuming alcohol for at least 7000 years.¹³ Additionally, nowadays, most young people out on a date consume alcohol and it is a widely accepted equation that:

$$\text{Alcohol} + \text{Woman} = \text{Sex}^{13}$$

The suggestion is also made that this idea is not a uniquely UK view nor is it new – in the times of Greeks and Romans, Juvenal noted: When she is drunk what matters to the Goddess of Love? She cannot tell her groin from her head.

Another reference to the use/abuse of alcohol states that on an individual level alcohol was sometimes used in the most unethical ways to maintain and ensure a slightly different equation in relation to women:

$$\text{Alcohol} + \text{Woman} = \text{Compliance.}^{13}$$

Alcohol has been referred to as the oldest drug known to the human race and is widely perceived to affect sexual behaviour.¹⁴ Markos also highlights the perception of a correlation between alcohol and sex, stating, it is well engraved in the human mind since the earliest records of history. The biblical story of Lot's daughters and their planned plot to intoxicate their father with alcohol (to achieve pregnancy) is an illustration of one of the earliest reports on human perception of the relationship between alcohol and sex.¹⁴

1.4. Intoxication and victim outcomes

From the early 1990s American studies have identified differences in outcomes for rape victims when alcohol and/or drugs had been used. Their use was shown to be associated with more severe sexual abuse, more physical injury,¹⁵ more stranger assaults, more severe sexual victimisation and a greater likelihood of rape completion.^{16,17} This was later confirmed by a study carried out by the method of random digit dialling of women between the ages of 18 and 30, by The Research Institute on Addictions, University of Buffalo, New York. One of the outcomes from this study noted that when the victim was highly intoxicated, penetration was more likely. Victim injury was also more likely in assaults involving penetration.¹⁸

In a previous publication within the same journal, Testa et al.¹⁹ had suggested their findings demonstrated that forcible rape and incapacitated rape may be different forms of sexual assault, with different distal and proximal correlates. This study recommended acknowledging the difference between the two types of rape in order to understand better the role of alcohol and drug use in sexual assault.¹⁹

In 1998, a systematic review of the relevant literature revealed that the use of alcohol or illicit drugs increased

the vulnerability to date-rape. It highlighted a need for a consensus regarding the definitions of date-rape, sexual aggression and sexual assault, in order to facilitate understanding and assist with comparisons in research findings. Characteristics were identified which were considered to increase the vulnerability to date-rape. These included younger age of first date, early sexual activity, early age of menarche, a past history of sexual abuse or sexual victimisation and a greater willingness to accept rape myths and violence towards women. Additional date-specific risk factors were identified and included behaviour such as who initiated the date, who paid expenses, who drove, the location of the date, activity within the date and the use of alcohol or illicit drugs such as flunitrazepam. The review suggested that the use of alcohol could lead to the misinterpretation of friendly cues as sexual invitations, diminished coping responses and the female's inability to ward off a potential attack.²⁰

1.5. Alcohol and sexual behaviour

Links between alcohol, dating and sexuality had been studied by Abbey et al.²¹ prior to 1996. They found that dating, sexual and misperception experiences and alcohol consumption during these experiences predicted assault group status and that alcohol consumption during consensual sex and sexual misperceptions were positively related to alcohol consumption during the sexual assault.²¹ In other fields of research, links between alcohol consumption and behaviour have indicated that the expectation of alcohol induced disinhibition leads to greater sexual risk-taking behaviour such that individuals who hold this expectation require stronger skills and motivation in order to maintain safer sexual behaviour.²²

Alcohol consumption, perception of vulnerability and intended behaviour was examined by Testa and colleagues using a vignette or hypothetical situation, on 59 females aged 21–29 years. The researchers found that the consumption of alcohol created a positive perception of the male behaviour; created a sense of more benefit and less risk with some behaviours which were likely to facilitate a relationship while increasing sexual vulnerability and that it also created an anticipation of greater involvement in those behaviours.²³

Similarly, Abbey and colleagues used a vignette with 90 male and 90 female college students and found that intoxication created the perception of sexual arousal in the woman in the vignette and the perception of appropriate behaviour by the man in the vignette. They highlighted the importance of mediating cues in intoxicated decision making.²⁴

Using a Timeline Followback calendar method to assess daily alcohol consumption and concurrent daily incidents of sexual and non-sexual aggression, Parks and Fals-Stewart²⁵ found a temporal association between college women's alcohol consumption and increased risk for victimisation. On days classified as heavy for alcohol con-

sumption, they found that the odds of experiencing sexual aggression were 9 times higher, compared with days without alcohol consumption.²⁵

In July 2003 Abbey and colleagues, having studied the relationship between the quantity of alcohol consumed and the severity of sexual assaults committed by college men, reported their findings in the *Journal of Interpersonal Violence*.²⁶ This report includes a path-analytical model to demonstrate this relationship. One of their findings confirmed previous findings, that victim's alcohol consumption was linearly related to more severe forms of sexual assault.

The role of alcohol was deemed to vary depending on the type of relationship. In casual relationships, perpetrators may seek out intoxicated women because they view them as easy targets and fair game.^{26,27} In close relationships, alcohol may be perceived as a signal for sexual intimacy.²⁶

In 2004, the Research Society on Alcoholism, RSA, held a symposium in Vancouver, British Columbia, Canada and subsequently published a summary of the proceedings entitled 'Explicating Alcohol's Role in Acquaintance Sexual Assault: Complementary Perspectives and Convergent Findings'.²⁸ Four presentations were delivered, two of which examined female responses. The first, from Jeanette Norris, outlined a hypothetical model of the inter-relationships between alcohol consumption, expectancies, cognitions and resistance. The detailed analysis is worth repeating. Analyses revealed that there were no interactive effects of alcohol consumption and expectancies for direct or polite resistance. For passive resistance, two general patterns of findings emerged. In every model, cognition predicted passive resistance: the more a woman expressed concerns of being nice, uncertainty, shock, or powerlessness, the more likely she was to endorse passive resistance. The more that women expected alcohol to make them sexually vulnerable, the more that they endorsed these cognitions.

Expectancies also moderated alcohol's effect on passive resistance. As dosage increased, expectancies became more influential. As intoxication increased, so did uncertainty. The presenter hoped that these findings would provide some insight into the psychological processes underlying how women deal with an unfolding sexual assault. It was stated that even a slight increase in a woman's belief that she is powerless to protect herself when being sexually assaulted and a commensurate increase in passivity could be enough to effect the completion of a rape. It was emphasised that the complete onus for avoiding sexual assault should not be placed on women, but that this information could be used to empower women to have more control in these types of situations.²⁸

Abbey then presented a comparative study of sexual assaults involving intoxication, physical force and verbal coercion. All 3 types of sexual assault were found to have negative consequences for the victim. The worst scores arose from the use of physical force; the lowest scores arose

from verbal coercion, whilst the use of intoxicants scored mid-way between these two.

What also emerged was the need to further examine the role of alcohol in sexual assaults. It was postulated, there may be a curvi-linear relationship between the perpetrator's aggressiveness and his alcohol consumption such that increased alcohol consumption leads to greater aggressiveness until the level of impairment becomes so extreme that motor functioning begins to decline. However, it was also suggested that when the victim is extremely intoxicated, the perpetrator might not need to use much physical force because she is unable to physically resist.

The paper summarised the findings from the symposium by stating that survey data show that alcohol's role remains important and is multi-faceted; experimental data demonstrated that some of alcohol's effects in such assaults could be genuinely causal. Some of the findings were consistent with interpretations drawn from alcohol expectancy theory and/or alcohol myopia theory.²⁸

It was suggested; young men may drink and encourage a woman's drinking on the basis of alcohol expectancies that subsequently steer attention myopically towards rape-prone foci as intoxication rises, ensnaring both people in an unfortunate trajectory.²⁸

1.6. Quantitative evidence

The study by Abbey et al. in 2003²⁶ examined quantitative aspects of alcohol consumption from the perpetrators' viewpoint. It stated that, as found in most research, perpetrators' and victims' alcohol consumption were strongly, positively correlated.

Perpetrators' alcohol consumption during the rape had a curvi-linear relationship to their aggressiveness, victims' resistance, and victims' injuries. The relationship was mildly U-shaped, with the highest levels of aggression, resistance and injuries occurring when perpetrators did not drink at all and when they drank the largest quantities of alcohol.

In contrast, victims' alcohol consumption was negatively, linearly related to outcomes such that the more alcohol victims drank the lower perpetrators' aggressiveness, victims' resistance and victims' injuries. They stressed the importance of quantifying alcohol consumption in sexual assault cases. They also concluded with the message that a prevention programme which reduces students alcohol consumption will also be likely to reduce the rate of sexual assaults involving alcohol.²⁶

Shortly after the appearance of this message, prevalence data emerged from three Harvard School of Public Health College Alcohol Study surveys, on rape whilst under the influence of intoxication.²⁹ The samples included 8567 women in a 1997 survey, 8425 in a 1999 survey and 6988 in a 2001 survey. Combining these surveys provided information from almost 24,000 responses, 4.7% of which reported having been raped. Of these, almost three quarters, (72%) experienced rape whilst

intoxicated. Furthermore, other factors such as age (under 21), white skin, residence (sorority houses), use of illicit drugs, heavy alcohol consumption at high school, or attendance at college with high rates of episodic drinking, were also found to increase the risk of rape whilst intoxicated.²⁹

Meanwhile, data had been collected from 1014 cases of alleged DFSA, during the period January 2000–December 2002, by the Forensic Science Service in London.³⁰ This study is believed to be the first to provide details of blood alcohol concentrations found in cases of alleged DFSA.

Of the 1014 cases, 391 had forensic samples taken within 12 h of the alleged incident, 81% of which contained alcohol. Of these, 233 (60%) had a high back-calculated alcohol level, where high is defined as greater than 150 milligrams per millilitres (150 mg%), sufficient to cause at least drunkenness in a social drinker. In 36% of cases, the back-calculated concentrations were very high, i.e. over 200 mg% (sufficient to cause at least heavy drunkenness in a social drinker) and in 4% of cases the back-calculated concentrations were over 300 mg% (sufficient to cause extreme drunkenness in a social drinker). The authors urged the need for caution in the interpretation of these high figures and suggested that they be used as a guide only, although their findings did confirm previous suggestions of the significant incidence of alcohol implied by Hindmarch and others.

Scott-Ham and Burton stated that many of the concentrations reported could have caused disorientation, potential memory loss or even loss of consciousness. In about 60% of cases, the alcohol evidence alone would be relevant to the question of whether or not the victim would have been in a position to give informed consent – an important issue in cases of rape and sexual assault.

They conclude with the assumption that alcohol had not been added clandestinely, but that these levels reflect the high alcohol concentrations attained during social drinking.³⁰

1.7. Drinking patterns

At about the same time, a group of researchers from the University of Michigan published their findings on the drinking patterns of college women, focusing particularly on heavy drinkers.³¹ They stated that, in previous reports, 10% of college women drank to get drunk compared to 20% of college males, but that the difference between the two had been eroded with time. They reflected the popular press notion that the recent pattern in undergraduate women's binge drinking fulfilled a notion of an alcohol rite of passage serving equality in gender roles. However, findings from this study suggested, women who were frequent binge drinkers throughout college...appeared the most vulnerable to men's opinions because of their preference to socialise with male peers over female peers. They further stated, copying the drinking behaviours of their male peers provided college women with a special position among male drinking groups because such behaviours were sexu-

ally appealing to their male peers and elevated their social position in contrast to other females. They highlighted the need to address the health ramifications of excessive drinking for undergraduate women and emphasised the risks of high levels of intoxication and vulnerability to sexual assault, as had been found in previous studies.³¹

In Australia, Hurley and colleagues examined alleged DFSA case files for a 12-month period, ending in April 2003.⁴ A total of 434 cases were identified, 76 of which fulfilled the criteria for further scrutiny, with a median time delay of 20 h. They found that in 77% of cases, alcohol consumption was reported; whilst in 37% of cases, alcohol was still present when later examined. They found an average blood alcohol of 0.11% (equivalent to 110 mg%) at the time of examination. This equates to an average blood alcohol concentration (BAC) of 0.22–0.33% (or 220–330 mg%) at the time of the alleged assault, assuming no alcohol had been consumed post-assault. This level, they state, is equivalent to the consumption of at least 20 standard drinks.

The paper also highlights the effects of high alcohol levels on behaviour, stating, they, (alcohol levels) are likely to have a significant impact on conscious state, the ability to provide competent consent and to accurately recall details of the events.⁴ Furthermore, they suggest that their figures are an underestimate of the actual number of incidents of intoxication and sexual assault, due to the possibilities of late reporting, (when there may be a failure to detect drugs consumed earlier), or if the allegation is subsequently withdrawn, or, if no allegation is reported, or, for reasons relating to a failure of detection by toxicological methods. They remind us that both GHB and alcohol are likely underestimates due to their rapid metabolism from the body.

This paper further discusses some aspects of an alleged victims' inability to provide a clear account of their drug consumption or of the alleged sexual activity. One possible explanation, they suggest, could be the amnesic effect of drugs taken, especially alcohol, at the recorded levels. Like other authors, they conclude that many individuals had consumed large volumes of alcohol prior to the alleged assault, and in many cases this alcohol consumption was combined with the use of other psychoactive drugs (prescribed and recreational). Alone or in combination these substances may affect conscious state, the ability to consent to sexual activity and proper recall of the events.⁴ In July 2006 Horvath and Brown published further evidence of the association between rape and intoxication.³² They stated that alcohol and drugs have been inextricably linked with sexual assault. Data was examined over a 5-year period (1999–2004), of rape cases reported to the police. One of the consistent findings identified the fact that the victim's state of sobriety or inebriation appeared more significant than that of the offender.³²

Two months later, results from experimental studies on the role of women's alcohol consumption in managing sexual intimacy and sexual safety motives were published in the USA. Testa et al. concluded, that alcohol appeared to

reduce intentions to resist sexual advances from an acquaintance while increasing intentions to pursue relationship-enhancing behaviours.³³

By October 2006 Kaysen and colleagues had published further confirmation of the association between alcohol consumption and sexual assault.³⁴ A 3-year prospective analysis of 1238 college students, examined the timing of alcohol related sexual assaults (incapacitated rape) in relation to both alcohol consumption and alcohol-related negative consequences. The results indicated that incapacitated rape was associated with higher alcohol use and more negative consequences in the years prior to the assault. Additionally, they found that incapacitated rape was also associated with higher alcohol use and more negative consequences during the year in which the rape took place and subsequent years. They concluded that alcohol use could function as both risk factor and consequence of sexual victimisation.³⁴

1.8. Conclusion

The importance of an acceptable and agreed definition of DFSA and date-rape cannot be underestimated as we seek to achieve a meaningful understanding of this subject. An acceptable and agreed definition is essential for the purposes of research comparison, public awareness and perception and for the development of health education programmes for our young people. The current differentiation between pro-active and opportunistic DFSA, offered by the authors of Operation Matisse, would appear to meet these requirements.

Within the past few years, the message that alcohol consumption alone, without the addition of other so-called date-rape drugs, can expose a person to unwanted or risky sexual activity has appeared^{35–37} Wikipedia, the free encyclopedia, now identifies alcohol as the drug most frequently implicated in substance-assisted sexual assault³⁸ having the same effects as date-rape drugs.³⁹ It also states, sometimes victims end up drinking too much and insist that they were drugged when in fact they overestimated their tolerance for alcohol.³⁹

The message, that binge drinking is more likely to be responsible for increased vulnerability to sexual assault, is one that needs to be made clear without ambiguity and without prejudice or judgement. At the time of writing there is evidence that the lay press is starting to report the scientific findings. One such article by Jenny Hope, Daily Mail, was entitled 'drug rape myth exposed as study reveals binge drinking is to blame'. She quotes a study from Wrexham Maelor Hospital and reports doctors' views on drink spiking as being an excuse for binge drinking.⁴⁰

Results from The Investigation of Drug Facilitated Sexual Assault (Operation Matisse)⁶ have indicated (amongst others) the following;

Rohypnol, synonymous in many quarters with the phrase date-rape drug might not be the threat it is believed to be, and high blood alcohol levels (>200 mg% in 70 % of

cases tested) would require alcohol consumption such that an average woman would have to drink eight standard glasses of wine over 2–3 h.

The practical aspects of the management of cases of sexual assault now need to be reconsidered in the light of current evidence of binge drinking. Suggestions in the report following Operation Matisse include the incorporation of a questionnaire into the standard forensic medical examination to aid analysis and interpretation of the findings; the use of early evidence kits by non-medical personnel and the need for further research into the forensic examination of hair samples in order to detect GHB.

Recommendations have also been made to raise public awareness of any potential threat together with advice on reducing the potential of becoming a victim.

Additionally the issue of drunken consent or capacity to give informed consent whilst intoxicated is identified with the reassurance that whilst this debate continues, each case will be decided on its own merits and that this should not influence the police/CPS approach at the outset.⁶

References

1. Payne-James J, Busutil A, Smock W, editors. *Forensic medicine clinical and pathological aspects*, 2003 GMM.
2. Payne-James J, Rogers D. Drug-facilitated sexual assault, "ladettes" and alcohol. *JRSM* 2002;95:326–7.
3. LeBeau M, Moyazani A. *Drug-facilitated sexual assault. A forensic handbook*. London: Academic Press; 2001.
4. Hurley M, Parker H, Wells D. The epidemiology of drug facilitated sexual assault. *J Clin Forensic Med* 2006;13:181–5.
5. Scott-Ham M, Burton F. Toxicological findings in cases of alleged drug-facilitated sexual assault in the United Kingdom over a 3-year period. *J Clin Forensic Med* 2005;12:175–86.
6. Operation Matisse. *Investigating Drug Facilitated Sexual Assault. Association of Chief Police Officers*. Viewed at <http://www.acpo.police.uk/asp/policies/Data/operatin%20Matisse> on 13/12/06.
7. Date-rape. *Definition and Much More*. Viewed @ <http://www.answers.com/date+rape&r=67>. 14/02/07.
8. Hindmarch M, Elsohly J, Gambles S, Salamone. Forensic urinalysis of drug use in cases of alleged sexual assault. *J Clin Forensic Medicine* 2001;8:197–205.
9. Schwartz RH, Milteer R, LeBeau MA. Drug-facilitated sexual assault ('date rape'). *South Med J* 2000;93(6):558–61.
10. Elsohly MA, Salamone SJ. Prevalence of drugs in cases of alleged sexual assault. *J Anal Toxicol* 1999;23(3):141–6.
11. Slaughter L. Involvement of drugs in sexual assault. *J Reprod Med* 2000;45(5):425–30.
12. Saint- Martin P et al. Chemical submission – a literature review. *Therapie* 2006;61(2):145–50.
13. Plant M, Plant M. *Binge Britain. Alcohol and the National Response*. Oxford University Press; 2006.
14. Markos AR. Alcohol and sexual behaviour. *Int J STD AIDS* 2005;16(2):123–7.
15. Ullman SE, Knight RA. The efficacy of women's resistance strategies in rape situations. *Psychol Women Quart* 1993;17:23.
16. Abbey A, Thompson Ross L, McDuffie D, McAuslan P. Alcohol and dating risk factors for sexual assault among college women. *Psychol Women* 1996;20:147–69.
17. Ullman SE, Brecklin LR. Alcohol and adult sexual assault in a national sample of women. *J Subst Abuse* 2000;11:405–20.

18. Testa et al. The role of victim and perpetrator intoxication on sexual assault outcomes. *J Stud Alcohol* 2004;65(3):320–9.
19. Testa et al. The role of women's substance use in vulnerability to forcible and incapacitated rape. *J Stud Alcohol* 2003;64(6):756–64.
20. Rickert VI, Wiemann CM. Date rape among adolescents and young adults. *J Pediatr Adolesc Gynecol* 1998;11(4):167–75.
21. Abbey A, Thompson Ross L, McDuffie D, McAuslan P. Alcohol and dating risk factors for sexual assault among college women. *Psychol Women* 1996;20:147–69.
22. Dermen KH, Cooper ML, Agocha VB. Sex related alcohol expectancies as moderators of the relationship between alcohol use and risky sex in adolescents. *J Stud Alcohol* 1998;59(1):71–7.
23. Testa M, Livingston JA, Collins RL. The role of women's alcohol consumption in evaluation of vulnerability to sexual aggression. *Exp Clin Psychopharmacol* 2000;8(2):185–91.
24. Abbey et al. Alcohol's effects on perceptions of a potential date rape. *J Stud Alcohol* 2003;64(5):669–77.
25. Parks KA, Fals-Stewart W. The temporal relationship between college women's alcohol consumption and victimisation experiences. *Alcohol Clin Exp Res* 2004;28(4):625–9.
26. Abbey A, Clinton-Sherrod AM, et al. The relationship between the quantity of alcohol consumed and the severity of sexual assaults committed by college men. *J Interpers Viol* 2003;18:813–33.
27. Kanin EJ. Date Rapists: differential sexual socialisation and relative deprivation. *Arch Sex Behav* 1985;14(3):219–31.
28. Zawacki, Norris, et al. Explicating alcohol's role in acquaintance sexual assault: complementary perspectives and convergent findings. *Alcohol Clin Exp Res* 2005;29(2):263–9.
29. Mohler-Kuo M, Dowdall GW, et al. Correlates of rape while intoxicated in a national sample of women. *J Stud Alcohol* 2004;65(1):37–45.
30. Scott-Ham M, Burton F. A study of blood and urine alcohol concentrations in cases of drug-facilitated sexual assault in the United Kingdom over a 3-year period. *J Clin Forensic Med* 2006;13(3):107–11.
31. Young et al. Drinking like a guy: frequent binge drinking among undergraduate women. *Subst Use Misuse* 2005;40:241–67.
32. Horvath MA, Brown J. The role of drugs and alcohol in rape. *Med Sci Law* 2006;46(3):219–28.
33. Testa et al. The role of women's alcohol consumption in managing sexual intimacy and sexual safety motives. *J Stud Alcohol* 2006;67(5):665–74.
34. Kaysen et al. Incapacitated rape and alcohol use: a prospective analysis. *Addict Behav* 2006;31(10):820–32.
35. Womenshealth.gov. US Dept of Health & Human Services. Viewed at www.4woman.gov/FAQ/rohypnol.htm on 20/09/07.
36. Womenshealth.gov. US Dept. of Health & Human Services. Viewed at <http://www.4woman.gov/FAQ/sexualassault.htm> on 20/09/07.
37. TeensHealth Date Rape. Viewed on 20/09/07 at http://www.kids-health.org/teen/your_mind/relationship/date_rape.html.
38. Date rape. *Wikipedia, the free encyclopedia*. viewed at <http://en.wikipedia.org/wiki/Daterape>. On 20/09/07.
39. Date rape drug. *Wikipedia, the free encyclopedia*. viewed at http://en.wikipedia.org/wiki/Date_rape_drug. On 20/09/07.
40. Daily Mail. *Drug rape myth exposed as study reveals binge drinking is to blame*. Jenny Hope. Viewed at <http://www.dailymail.co.uk/pages/text/print>. On 20/09/07.